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THE CONTROL OF LETTUCE INSECTS

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The control of insects is necessary for the successful commercial production of lettuce in the irrigated areas of Arizona. Among the important insects are the cabbage looper[3/], the corn earworm[4/], the fall armyworm[5/], the beet armyworm[6/], the green peach aphid[7/], and the lettuce aphid[8/].

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3/ Trichoplusia ni (Hbn.).

4/ Heliothis zea (Boddie).

5/ Laphygma frugiperda (Hbn.).

6/ Laphygma exigua (J. E. Smith).

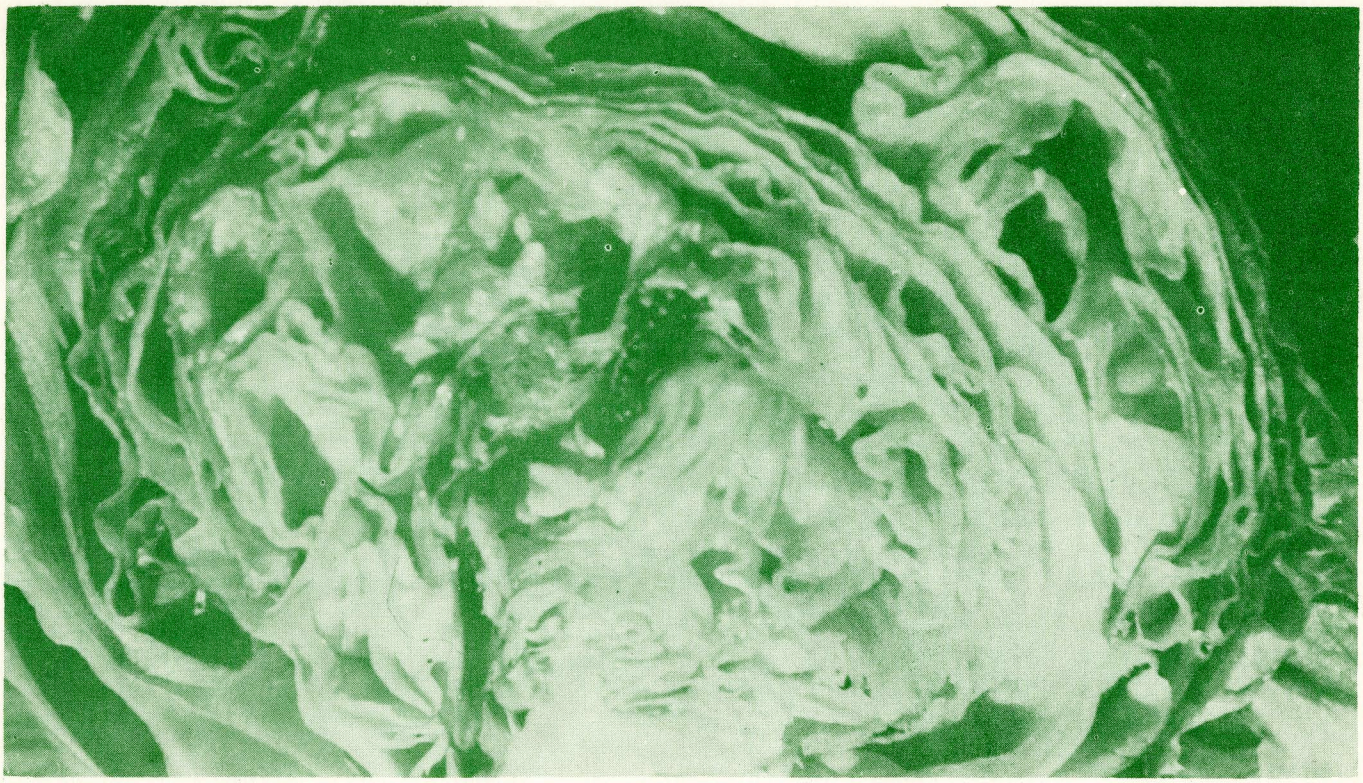
7/ Myzus persicae (Sulz).

8/ Macrosiphum barri Eggis.

The Cabbage Looper

The cabbage looper is usually the most destructive of these pests. Since it is apparently becoming more difficult to control with DDT and some other insecticides, continued research is necessary to find better insecticides and the best possible methods of application. The difficulty of controlling this insect in recent years may have been due in part to the earlier planting dates, so that the plants are exposed to more severe attack when they are small. Moreover, the increased use of insecticides on cotton and other cr in the area may have reduced the numbers of parasites and predators +

Greatly enlarged photograph of Cabbage Looper on a lettuce leaf.



Enlarged photo of a head of lettuce, cut to show Corn Earworm at work.

in controlling the looper, as well as other lettuce insects. Since poor results are sometimes obtained with dusts that have ample or even excessive amounts of toxic ingredients, improvement in application methods may be more important than finding more toxic substitutes.

The following insecticidal dusts have been found to be effective when applied at 20 pounds per acre:

(1) toxaphene 15 percent plus DDT 5 percent

(2) toxaphene 10 percent, DDT 10 percent, plus parathion 2 percent

(3) toxaphene 15 percent plus parathion 2 percent

(4) cryolite 50 percent plus DDT 10 percent

(5) Phosdrin 2 percent

Other materials and combinations of materials have also been tested, but none have been found to be more effective or cheaper than the toxaphene-DDT dust. The Phosdrin dust is effective but has little residual toxicity. It is recommended only when late-season applications are necessary for looper control.

If sprays are used, apply sufficient spray mixture to give the following dosages of actual toxicant per acre:

(1) toxaphene 3 lbs. plus DDT 1 lb.

(2) toxaphene 2 lbs. DDT 2 lbs., plus parathion 2/5 lb.

(3) toxaphene 3 lbs. plus parathion 2/5 lb.

(4) Phosdrin 2/5 lb.

(cryolite is not available in spray form).

Corn Earworm and Other Worms

In some years the corn earworm has caused considerable damage to lettuce. The earworms feed inside the heads, where their presence often cannot be detected by visual inspection. If cutting open the heads shows

any appreciable percentage to be infested, the entire field must be discarded. Severely infested crops are unmarketable.

In recent years the corn earworm on the fall crop seems to have been well controlled by the vigorous insecticide treatments used to control the cabbage looper. It may be more serious on the spring crop, when the looper usually is not a problem. If eggs or small earworms can be found by close observation just before the heads begin to form, an insecticide containing DDT should be applied. A dust containing 10 percent of DDT or 15 percent of toxaphene plus 5 percent of DDT should be effective. Do not apply these dusts after the heads begin to form.

The treatments for the loopers will also usually control other worms on lettuce, such as the fall armyworm, the beet armyworm, the yellow-striped armyworm[6/] and various cutworms. The best control for the salt marsh caterpillar[7/] is the use of aluminum foil barriers around the field.

6/ Prodenia ornithogalli Guen.

7/ Estigmene acrea (Drury).

Aphids

Aphids are generally a problem on lettuce during the spring growing season, and infestations are sometimes severe. The aphids feed by sucking the sap from the plants, thus reducing their vigor. The presence of the aphids and the honey dew they produce are objectionable on the lettuce heads. In addition, aphid transmission of mosaic virus sometimes causes serious losses. The most abundant species on lettuce are the green peach aphid and the lettuce aphid. The green peach aphid is usually the more important. The following insecticides are recommended for aphid control: Parathion or

Phosdrin at one-fourth pound per acre, or malathion at one to two pounds per acre in either sprays or dusts, and demeton at two-fifths pound per acre in a spray. (All amounts are on the basis of actual toxicant per acre). Parathion and Phosdrin are available as 2-percent dusts and malathion as a 5-percent dust.

When to Apply Insecticides

Make the first application to fall lettuce soon after the plants are up. Control treatments made when the plants are small will prevent excessive damage by worms and loss of stand. This may be difficult with severe infestations, because rapidly growing small plants have less effective residual insecticide on the leaves. Usually another application should be made just before thinning. If this is not effective, a treatment applied just after thinning may be necessary to prevent plant (stand) loss. Three or four applications may be sufficient, but the number will vary with the severity of the infestation and the success of the previous application. Since much insecticide can be wasted in lettuce production, the fields should be checked thoroughly before a decision is reached as to the need for further applications. DDT and toxaphene should not be applied after the heads begin to form, because there is likely to be an over-tolerance of residue if applied closer to harvest. Treatment before the heads have formed is especially important to prevent infestation by the corn earworm.

With thorough applications until the heads begin to form, additional treatments are often unnecessary. If the loopers appear after this time, Phosdrin may be applied up to two days before harvest. Parathion or demeton should not be applied within 21 days, or malathion within 10 days before harvest. Cryolite should not be applied after the heads begin to form.

How to Apply Insecticides

Dusts or sprays may be applied with ground equipment or from the air. On low-growing lettuce ground equipment is preferred.

Apply the dusts at 20 to 25 pounds per acre. If you use a spray, apply the same amount of active toxicant per acre as for a dust. When spraying, use sufficient water to give good coverage. This will depend on the equipment. Some sprayers designed to use concentrated emulsions give good coverage with as little as 10 gallons per acre.

A number of good power dusters are on the market. Either a tractor-mounted duster utilizing a power take-off or one equipped with an auxiliary motor is satisfactory if in good repair and in proper adjustment. Always set the nozzles directly over the lettuce rows and do not have the outlets too high above the plants.

Drive slowly. You cannot dust well at high speed. Have the air volume and velocity at the nozzles sufficient to penetrate the foliage but not enough to blow the dust off the leaves. There should not be enough turbulence to cause the dust to float away. On younger lettuce a lightweight canvas drag may be used to check drift and thus make the duster more efficient. Do not dust if the wind movement is more than about 4 miles an hour. Slightly more wind can be tolerated in spraying. To estimate the wind velocity toss a handful of dust or blow smoke into the air and then walk downwind with the cloud. If you have to walk fast to keep up with it, the wind is too strong for dusting.

Precautions

Most insecticides are poisonous to people and farm animals. Follow all directions and precautions printed on the container labels.

Store insecticides in closed containers in a dry place where children and animals cannot reach them. Keep them off your skin and away from your eyes, nose, and mouth. Wear a respirator and goggles when you are working with concentrated sprays or dusts. If any insecticide is spilled on the skin or clothing, wash it off and change clothes immediately. If you should accidently swallow some insecticide, induce vomiting by taking 1 tablespoonful of salt in a glass of warm water. Repeat if necessary. Call a physician. Work on the windward side of the crop being treated. When you have finished the job, wash all exposed surfaces of the body with soap and water.

Parathion and Phosdrin are extremely poisonous. They should be applied only by persons thoroughly familiar with their hazards, and who will comply with all precautions on the labels.

To protect fish and wildlife, be careful not to contaminate streams, lakes, or ponds with insecticides. Avoid getting this material onto pasture grass or feed.

Do not apply insecticides when hives of bees are near enough to be affected by the drift. Dust or spray at night, if possible, to avoid poisoning bees.

Use only recommended insecticides on lettuce.